CLAIMS

1. A multiple electrode for measuring electro-physiological characteristics of a biological specimen, comprising:

a plurality of micro-electrodes provided on a first region on a substrate; and

a reference electrode provided in a second region on the substrate,

wherein the reference electrode includes at least one stimulus reference electrode for applying an electrical signal to the plurality of micro-electrodes.

2. A multiple electrode according to claim 1, wherein the reference electrode includes at least one measurement reference electrode for detecting an electrical signal from the plurality of micro-electrodes, and the stimulus reference electrode is electrically insulated from the measurement reference electrode.

3. A multiple electrode according to claim 1 or 2, wherein the second region is placed at a distance from an outer edge of the first region, and surrounds the first region.

4. A multiple electrode according to any of claims 1 to 3, wherein the biological specimen is placed in such a manner as to overlap with the first region and not to overlap with the second region.

5. A multiple electrode according to claim 3 or 4, wherein the distance is set to a value such that an electrical signal generated from a micro-electrode receiving an applied electrical signal is detected, and electrical noise

generated from a micro-electrode receiving no applied electrical signal is not detected.

6. A multiple electrode according to any of claims 2 to 5, including a plurality of stimulus reference electrodes and a plurality of measurement reference electrodes, and the plurality of stimulus reference electrodes or the plurality of measurement reference electrodes are substantially symmetrically provided with respect to a center of the first region.

7. A multiple electrode according to any of claims 1 to 6, wherein the plurality of micro-electrodes are arranged in a matrix within the first region.

8. An integrated cell installer comprising a multiple electrode according to any of claims 1 to 7, wherein the integrated cell installer has a cell installing region for placing a biological specimen on the substrate of the multiple electrode.

9. A cellular potential measuring apparatus comprising: an integrated cell installer according to claim 8; an output signal processor connected to the micro-electrodes for processing an output signal due to an electro-physiological activity of a biological specimen; and a stimulus signal provider for optionally providing an electrical stimulus to the biological specimen.

10. A cellular potential measuring system comprising: a cellular potential measuring apparatus according to claim 9; and an optical monitoring apparatus for optically monitoring a biological specimen; and/or a cell culture

apparatus for controlling the culture environment of the biological specimen.